Attachment A

2008 PIER Transportation Program
Advanced Heavy-Duty Natural Gas Engine R&D Solicitation
Scoring Criteria

Scoring will be based on the merits of the proposed project in addressing each of the following topics. Each criterion will be scored on a basis of 0 to 10 points and then multiplied by the corresponding weighting factor. The resulting scores will be summed to provide the overall project score. A minimum score of 70 (out of 100) is required to be eligible for funding.

Scoring Scale

Each proposal will be scored on the degree to which it meets each of the Technical Evaluation Criteria, as shown in the table below.

0	Not responsive to the criterion
1-2	Response is minimal
3-4	Responds only marginally to relevant considerations under the criterion
5-6	Responds satisfactorily to most relevant considerations under the criterion
7-8	Responds satisfactorily to all relevant considerations under the criterion
9	Responds completely, accurately, and convincingly to all relevant considerations under the criterion
10	Response is complete, specific, and superior, both quantitatively and qualitatively

1. Technical Merits

Criterion Scoring Range: 0-10
Weighting Factor: 2.0
Maximum Possible Points: 20

- Extent to which the proposed work will comprehensively address the development and prototype testing of advanced HD NG engine concepts for later product development and/or the development of engine components and systems for near-term market introduction.
- Adequacy of the discussion of the current status of HD NG engine technologies that constitute the baseline for improvement of efficiency and power density in targeted California market sectors.
- Adequacy of the discussion of the novelty, innovation, uniqueness, sustainability, and originality of the proposed technology advancement for improved engine efficiency and competitiveness; the scientific and technical principles underlying the proposed work; and the manner in which scientific and engineering principles will be applied.

- Validity of the proposed technical approach and likelihood of success based on the soundness of engine technology principles employed in the proposed work.
- Adequacy of the discussion of how the proposed work addresses current market barriers and knowledge gaps to help advance the state-of-the-art and market acceptance and how and why the proposed development project is an appropriate next RD&D step.
- Proposing concepts that offer significant reduction in fuel consumption relative to conventional NGV heavy-duty engines in targeted California market sectors.
- Developing an intelligent engine with advanced control capability to operate with maximum efficiency under a wide variety of conditions. This includes efficient operation at part load and the capability to adapt to a range of fuel properties (such as biogas, propane, imported LNG, or hydrogen blending), to improve competitiveness and enable penetration into wider markets worldwide. Penetration into wider markets is desired to achieve production-scale economies to improve competitive pricing.
- Adaptation to fuels other than commercial CNG or LNG might be automatic, might involve in-use changes such as “reflash,” or might constitute alternative commercial product options.
- Exceeding applicable ARB heavy-duty on-road emission certification requirements.

2. Technical Approach

Criterion Scoring Range: 0-10
Weighting Factor: 2.0
Maximum Possible Points: 20

- Degree to which the technical approach is clearly stated, achievable, sustainable technically, and economically feasible to expand the market for HD NGVs.
- Extent to which the technical tasks are adequately, clearly, and logically presented with appropriate objectives, logical and discrete tasks and subtasks, sequence of activities, reasonableness of schedule, and budget.
- Quantitative or measurable technical engine efficiency and performance goals are clearly stated.
- Adequacy of discussion of the likelihood of success based upon a sound R&D methodology and plan.
- The proposed project cost is consistent with the work to be performed and is fully justified.
- The PIER funding request, match funding, and need for PIER funding are appropriate and consistent with the expected level of public benefits if the project is successful.

3. Technical Qualifications, Management, and Project Team

Criterion Scoring Range: 0-10
Weighting Factor: 1.5
Maximum Possible Points: 15

- Evidence of organizational experience, knowledge, capabilities, and a history of performance that will lead to successful completion of the proposed project.
- The proposal clearly describes how the Project Manager will successfully manage the project, control cost, maintain the schedule, and report results and accomplishments in an effective manner.
- The proposal clearly and adequately describes the capabilities and experience of the team members to perform the proposed work.
- The proposal clearly shows how the team members will collaborate to facilitate transfer of project products to the marketplace.
- Level of participation by project participants (i.e., partners and subcontractors) is documented by letters of commitment.
- Extent of beneficial collaboration across industry, communities, other state and federal agencies, and academia.

4. Market Application and Commercialization Strategies

Criterion Scoring Range: 0-10
Weighting Factor: 1.5
Maximum Possible Points: 15

- Adequate discussion of how the project will accelerate the beneficial market deployment of HD NGVs.
- Adequate discussion and analysis of the potential for the prospective improved HD NG engine technology to improve cost competitiveness over current baseline products.
- Adequate discussion of a reasonable path and strategy for commercialization of improved HD NG engines and vehicles.
- Adequacy of discussion describing experience, ability, past successes, and approach to market development for improved HG NG engines and vehicles.
- Adequate discussion of quantified public benefits to California natural gas ratepayers and other stakeholders.
- The degree to which the project addresses the need for efficiency improvement and focuses technology improvement on benefits that will contribute to HD NGV market growth, with appropriate levels of risk and timing to commercialization.
- How well the project supports California energy policy, or may provide a basis for informing future energy policy.

- Targeting engines for OEM vehicle applications that have a significant presence in California fleets.
- Targeting high fuel use heavy-duty fleet applications and market sectors, including those that are not currently using natural gas, both on- and non-road.
- Proposing technologies that can be broadly applied to different heavy-duty NGV engines, with a variety of power levels, and implemented into a variety of vehicle applications.
- Providing market-competitive driving characteristics, without performance compromises.
- Assuring high likelihood of bringing beneficial products to market by:
    - Having a project team capable of successfully implementing the new technologies in California and able to adequately support the needs of the California market.
    - Having a clear commercialization approach and pathway.

5. Project Budget

Criterion Scoring Range: 0-10
Weighting Factor: 2.0
Maximum Possible Points: 20

- The project cost is consistent with the work to be performed and is justified.
- The PIER funding request, match funding, and need for PIER funding are appropriate and consistent with the expected level of public and private benefits if the project is successful. In general, the greater the private benefits are anticipated and expected to be, the greater the match share percentage should be that is contributed towards the project.
- The degree to which the project requires PIER funding, rather than being funded from the competitive or regulated markets.

6. Other Significant Factors that Increase the Project's Merit

Criterion Scoring Range: 0-10
Weighting Factor: 1.0
Maximum Possible Points: 10

The following are examples of other significant factors that will be considered by the proposal evaluation team:

- The proposal shows that the technical approach is innovative or unique.
- The degree to which the project contributes to a balanced PIER portfolio across technology types, levels of risk, and/or time to commercialization.

- How well the project supports California energy policy, or may provide a basis for informing future energy policy.

Preference Points for California-Based Entities

Applicants meeting the criteria of a California-Based Entity (CBE) may have preference points added to their final technical score, subject to certain restrictions. Please see Attachment E for more information. Eligible applicants must request and demonstrate eligibility by filling out and submitting as part of the proposal package the questionnaire contained in Attachment F. Otherwise eligible applicants who do NOT submit the Attachment F questionnaire shall NOT be eligible for the CBE Preference Points.